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DDAS Accident Report

Accident details

Report date: 05/03/2011	Accident number: 637
Accident time: 11:30	Accident Date: 10/12/2008
Where it occurred: UN 1920E, Skouriotissa Village, Nicosia District	Country: Cyprus
Primary cause: Unavoidable (?)	Secondary cause: Inadequate equipment (?)
Class: Excavation accident	Date of main report: 11/12/2008
ID original source: 2008/02	Name of source: UNMACC Cyprus
Organisation: [Name removed]	
Mine/device: M14 AP blast	Ground condition: bushes/scrub soft
Date record created:	Date last modified: 05/03/2011
No of victims: 1	No of documents: 1

Map details

Longitude:	Latitude:
Alt. coord. system:	Coordinates fixed by:
Map east:	Map north:
Map scale:	Map series:
Map edition:	Map sheet:
Map name:	

Accident Notes

inadequate equipment (?)

handtool may have increased injury (?)

Accident report

The Bol report of this accident was made available in 2009. The conversion into a DDAS file has led to some of the original formatting being lost. Text in square brackets [] is editorial. The original Bol report is reproduced below, edited for anonymity.

BOARD OF INQUIRY INTO THE MINE ACCIDENT INVOLVING [The Victim] 10 DECEMBER 2008

References:

- a) Board of Inquiry convening order.
- b) Report of Demining accident that occurred in Minefield UN 1920E on Wednesday 10 December 2008
- c) Technical Standards and Guidelines Cyprus Edition 2 (TSGs)
- d) [Demining group] Standing Operating Procedures. (SOPs)
- e) Initial Incident Report. (Dated 10 December 2008)

1. INTRODUCTION

At 11:30 hrs on the 10 December 2008, a Demining accident occurred resulting in the injury to the Team leader of Mine Clearance Team Two- [the Victim].

The mine accident occurred at MF UN 1920 E Grid: 36SVD9345284462, Skouriotissa Village.

The task dossier number is 044 / 08

The task falls within the area of responsibility of the United Nations Mine Action Centre Cyprus (UNMAC) which in turn falls within the area of responsibility of the United Nations Force In Cyprus (UNFICYP) Sector 1.

As a result of the accident, a board of inquiry (BOI) was convened as per reference 'A' in order to investigate the aforementioned accident. This document can be found at inclusion 1 to this report.

2. AIM

The aim of this report is to:

Provide summary of the significant events/activities conducted during the BOI

To provide conclusions arrived at as a result of the findings of the BOI

To provide recommendations resulting from the aforementioned conclusions.

3. SUMMARY OF SIGNIFICANT ACTIVITIES CONDUCTED BY THE BOI

[A large table is held on file.]

The following provides a list of significant documentation other than references A.B.C.D and E that was made available to the BOI and that utilized to varying degree during its deliberations:

[none were made available]

3.1. Task Dossier No 44/08;

3.2. [Demining group] MCT 2 On site documentation;

3.3. External QA Log: Details the number of QA external Quality Assurance Monitoring and evaluations visits conducted on site since the start of operations. The log was found to be accurate and all visits were logged.

3.4. Visitors Log: The log details the number and names of visitors to the site since the start of operations, and was found to be accurate and all visits logged.

3.5. Letter from Doctor at receiving hospital Polyclinic Nicosia

4. DEMINING ACCIDENT FORMAL INVESTIGATION CONVENING ORDER AND TERMS OF REFERENCE

Convening Order for a Formal Investigation of the accident involving [the Victim] 10
December 2008: Reference: 2008/02, Date 11 Dec 2008

APPOINTMENT OF PERSONNEL TO CARRY OUT A FORMAL INVESTIGATION

References:

- A. MAC Technical Standards and Guidelines
- B. Demining incident detailed report.
- C. [Deminig group] Mine Action Cyprus, SOPs

1. [Name removed], the Programme Manager of the MAC Cyprus, hereby appoints the following personnel to investigate the circumstances surrounding the demining accident that occurred at 11:35 on 10 December 2008 at Minefield 1920 involving [the Victim], Team Leader team 2, [Deminig group] Mine Action Cyprus

- A, Chairman - [Name removed], Mine Action Centre Cyprus
- B. Member - [Name removed], [Other demining group] Cyprus
- C. Member - [Name removed], [Deminig group] Mine Action Cyprus

2. The incident involved [the Victim] detonating an anti-personnel mine whilst excavating a contact. The investigation report is to be submitted by 18 December 2008. In the event that the completed report is not able to be submitted on the date indicated an interim report outlining progress with the investigation and the reason for the delay is to be submitted on that date and further interim reports provided every (two) days until the completed investigation report is submitted.

3. Your formal investigation and report are specifically to cover the following:

Details of the tasks being carried out at the time of the incident.

When and where the incident occurred.

How the incident occurred including a description of the events that led up to the incident, personnel, equipment and procedures involved.

The cause, nature and extent of injuries caused to personnel or damage to equipment, property or infrastructure as a result of the incident.

Why the incident occurred and whether the incident could have been avoided.

Any remedial action necessary to prevent future incidents of this nature occurring.

Any other matters that the BOI considers relevant to the incident.

4. In investigating the incident the following factors are to be considered:

The level of training and experience of the personnel involved in the incident, including where applicable, supervisory and managerial staff. This should also cover the dates and subjects covered for the most recent refresher training for the team, including if the members involved in the incident attended that refresher training.

The work routines being followed prior to and at the time of the incident including work start and finish times and rest period routines. Investigate if any handovers were occurring

between personnel working on the site and procedures followed for these handovers including any briefings involved.

The dates of the last leave period or day off work for personnel involved in the incident.

The dates and results of recent monitoring (internal and external) of the team involved in the incident.

The procedures being followed by the personnel involved in the incident for the activities being carried out at the time of the incident.

The safety equipment or protective clothing required to be used, or worn by the personnel involved in the incident, and whether the equipment or clothing was worn or used and if so, whether it was done so correctly. Also consider whether the use of safety equipment or protective clothing contributed to, or could have contributed to, a reduction in any injuries to personnel.

The medical and emergency support available to the team/personnel involved in the incident and whether this support was adequate or not in the circumstances of the incident. If the medical support was not adequate consider the possible affect this may have had on any casualties resulting from the incident.

Whether the incident was contributed to or caused by any of the following:

- (1) Any weakness in command and control.
- (2) Neglect, carelessness or misconduct by any of the personnel involved.
- (3) Personnel being given inappropriate or dangerous orders by supervisory or managerial staff.
- (4) Non-compliance with orders, instructions or procedures.
- (5) The use of alcohol, drugs or prescribed medication.
- (6) Deficiencies in standards or SOPs.
- (7) Incorrect use of equipment.
- (8) If shortfall in training of personnel is involved.
- (9) Injury or sickness to any personnel involved in the incident.
- (10) Malfunctioning of equipment or materials, including explosives.
- (11) The prevailing weather conditions.
- (12) Any deficiencies in basic support to personnel on the site for example provision of primary health care, shelter, food and water.

5. The report is to summarise the results of the investigation, draw conclusions as to the factors that contributed to the incident and make whatever recommendations necessary to prevent a future incident of this nature occurring.

6. The following documents should be included with the report:

A copy of the document appointing personnel to carry out a formal investigation.

A copy of the demining incident detailed report from the organisation involved in the incident.

Witness statements.

Sketches, diagrams, location and site plan as appropriate.

Photographs highlighting important aspects of the incident for example site conditions; mines, UXO, explosive devices or explosives involved; blast holes and blast debris; injuries to personnel; and equipment, property or infrastructure damage.

Task documentation, which may include survey reports, clearance plans, demining worksite plans or demining worksite documentation.

Extracts from standards and SOPs as required.

Medical records or coroner's reports.

Any further documentary evidence gathered during the investigation.

[Name removed], Programme Manager, Mine Action Centre Cyprus

5. TASK DETAILS

5.1. Minefield UN 1920 E

5.2. Start date 01 December 2008

5.3. North East of SKOURIOTISSA Village in NICOSIA District, Cyprus

5.4. MF Laid by the Turkish Forces in 1974

5.5. Minefield Layout is 4 x Mine Panels each with 2 x Mine Strips each with 2x Mine rows consisting of: M15 A/T, M2 A/P and M14 A/P. According to the records no M14 A/P mines have been laid in panels 1 and 2.

5.6. The Minefield is situated north of UN OP 25 on flat open ground running east-west, MCT 2 have 8 deminers working in the minefield.

5.7. The ground conditions are: Generally soft, open, low scrub, minor signs of soil erosion in the vicinity of the accident location by water.

5.8. The metal contamination is relatively low.

5.9. The minefield is fenced on the northern and western sides.

5.10. Prior to clearance being implemented a small number of mines could be seen from the perimeter of the minefield, during the technical survey many mines could be seen from the survey lanes.

5.11 Technical Survey was ongoing at the time of the accident.

6. SITE CONDITIONS

6.1. The weather was mild (above 15 Degrees centigrade) and calm.

7. WHEN AND WHERE THE ACCIDENT OCCURRED

7.1. The accident occurred on the 10 December 2008 at 11.30. At the time of the accident all team members of Team 2 were in their designated working lanes or areas.

7.2. The Team Leader, [the Victim], was conducting Internal QA checks of lane 5.

7.3. The accident occurred close to the junction between Survey lane 5 and Intermediate lane 3.

8. HOW ACCIDENT OCCURRED

8.1. The Team Leader, [the Victim], was investigating a signal just outside the overlap of Survey lane 5. The reason for investigating this signal was to confirm the location of a mine from a known cluster. During the investigation a mine functioned.

9. WHY THE ACCIDENT OCCURRED

9.1 Probable cause for this accident is that the handheld excavation tool (trowel) came either directly or indirectly in contact with the mine causing it to function.

9.2 It is possible that incorrect investigation drills were carried out. However this has not been verified in the witness statements. Evidence from the scene was erased by the detonation.

9.3 It is more probable that the mine was repositioned and not in a horizontal position. This may have been the cause for direct/indirect contact by the trowel with the pressure plate or bottom of the mine during the investigation drill.

9.4 There could be several reasons why the mine had be repositioned; erosion, movement by animals, other ground movement. There is evidence of ground movement in and around the minefield. To collaborate this fact the TF have erected several additional Force Protection fences around this area to counteract a possibility of migrating mines.

10. THE CAUSE, NATURE AND EXTENT OF INJURIES CAUSED TO PERSONNEL OR DAMAGE TO EQUIPMENT, PROPERTY OR INFRASTRUCTURE AS A RESULT OF THE INCIDENT.

10.1. Blast and secondary fragmentation from the trowel, soil and stones caused injury to the right hand and forearm. No other injuries were sustained.

10.2 The equipment involved in the accident was a Minelab F3 Detector and a hand trowel. Following the explosion the blade of the trowel was bent and the plastic handle was shattered. There was no damage to the detector.

10.3 The medical and emergency support was conducted by 2 team medics, with adequate equipment and transport. The evacuation procedure was safe, effective and proficient.

10.4 Personal Protective Equipment was fitted and worn correctly giving full protection as per specifications. Neither visor nor jacket [Frontal apron] was penetrated by secondary fragmentation thereby considerably negating the possibility of any further injuries.

11. CONCLUSIONS

11.1 The accident is confirmed to have involved the detonation of an M14 A/P mine.

11.2 The investigation of the seat of detonation shows that the mine was not buried deeper than 10cm. This is within the detection range of the detector in use.

11.3 From the damage sustained to the trowel, it is concluded that the tip came in contact with the mine which caused the mine to function.

11.4 Based upon the evidence gathered it is concluded that the Team Leader, [the Victim], was conducting his activities in compliance with the SOP. The BOI considers that the pressure plate (top of the mine) was not in a horizontal position and therefore in a disadvantaged position for the investigation. During this procedure the trowel applied direct or indirect pressure on the top or bottom of the mine which resulted in the detonation.

11.5 The BOI have found no deficiencies in the company's SOPs regarding this accident.

11.6 The BOI believes that the accident should be considered unavoidable.

Other conclusions

The casualty evacuation and immediate medical treatment at the level 1 facility was of an exemplary standard and should be commended.

On site record keeping and details by [Demining group] is sufficiently accurate and detailed to provide the necessary auditable trail of information required in the event of an incident such as these occurring or indeed everyday checks.

No handovers have or were due to take place on this site

All members of MCT 2 had taken annual leave from 1-18 August 2008

No weaknesses were found in the Command and Control of this site.

Refresher training with specific training on locating and identifying minimum metal mines was completed 19-22 August 2008.

There is no evidence of neglect, misconduct, use of illegal substances or alcohol.

Photographs and witness statements included in the [Demining group] Report of this accident are accepted as correct by the BOI.

12. RECOMMENDATIONS

12.1 The BOI agrees with [Demining group] accident report recommendations. Additionally:

The BOI recommends that [Demining group] should consider replacing the current hand trowel.

Once identified, areas of minor erosion or ground movement should be assessed by the field management to ascertain if there is an additional hazard of mines that have been repositioned. These areas should be recorded in the clearance record and treated with extra caution when being cleared. All demining staff should be briefed before working in such areas.

13. INTERNAL AND EXTERNAL QUALITY ASSURANCE

Internal

The last internal evaluation visit was conducted on 5 December 2008 and the last internal sampling conducted within the work lane 5 was conducted immediately prior to the accident.

The Field Supervisor was on site conducting an internal QA evaluation at the time of the accident.

External

The last external QA evaluation on Mine Clearance Team 2 was conducted on the 9 December 2008 and registered as acceptable. The QA Officer reported no problems or concerns with the clearance in general. It was stated in general comments, that the Survey lanes now have passed all 4 panels, reaching the M48 Parachute Flares and all boundaries of the minefield have been identified.

Victim Report

Victim number: 820

Name: [Name removed]

Age:

Gender: Male

Status: supervisory	Fit for work: yes
Compensation: N/A	Time to hospital: Not recorded
Protection issued: Frontal apron Long visor	Protection used: Frontal apron, Long visor

Summary of injuries:

INJURIES: minor Arm, minor Hand

COMMENT: "...injury to the right hand and forearm. No other injuries were sustained."

See Medical report.

Medical report

No medical report was made available. An email exchange with the Investigator revealed that:

"At first the injury looked bad and that he would lose the 2 out side fingers (little and ring finger). He was of course treated and evacuated to the hospital. On arrival he was rushed into surgery. On cleaning up the wound it was found he did not need any surgery and it was all fixed with staples and a big bandage.

He was back to full operational work in 12 days.

So nothing lost and no great injury, it just looked bad with all the blood, singed skin, but recovery was total and back to work in a couple of weeks."

Analysis

The primary cause of this accident is listed as *Unavoidable* because the investigation found that the Victim was working according to approved SOPs when the detonation occurred. The secondary cause is listed as *"Inadequate equipment"* because the hand-tool being used was not designed for purpose. It's separation ("shattered") in a small blast (28g) indicates that it was not blast-resistant. The injuries sustained may indicate that it was not long enough to keep the hand at a distance from the seat of initiation. The use of blast resistant tools as PPE is recommended in the IMAS (10.30), and the investigators correctly recommended that the Demining group consider its replacement.

The investigation was made available by the UNMAC in a timely manner, so allowing others to share from any lessons to be learned. Unfortunately, the file made available did not include details of the injuries sustained or the "exemplary" casualty evacuation procedure.